PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Upper Lions Lake

D. A. Jesson
1990

PWFWCP Report No. 96

105-02860/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: D. A. Jesson 1990. A reconnaissance survey of Upper Lions Lake. Peace/Williston Fish and Wildlife Compensation Program, Report No. 96. 20pp plus appendices.

Author(s): Duane A. Jesson[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave., 3rd Floor Prince George, B.C. V2L 3H9

A RECONNAISSANCE SURVEY OF

UPPER LIONS LAKE

WATERSHED: PARSNIP RIVER

DATE OF SURVEY: SEPTEMBER 20. 1989

FIELD CREW LEADER: D.A. JESSON

FIELD ASSISTANT: M.G. LABACH

REPORT PREPARED BY: D.A. JESSON

WILLISTON FISHERIES PROJECT

B. C. HYDRO

ENVIRONMENTAL RESOURCES

and

MINISTRY OF ENVIRONMENT

RECREATIONAL FISHERIES BRANCH

RELEASED BY: _____

D.H.G. Ableson, Regional Fisheries Biologist

LAKE: UPPER LIONS **SYSTEM NAME: UNNAMED C.**

A.S.A.P. REFERENCE NO.: **SYSTEM NO.: 25-1020-*****

DATA ON FILE FOR THIS SURVEY

Location	x	Dissolved O2/Temp. Profiles	x
Physical Data	x	Netting Record	x
Bench Mark	x	Lake Catch Summary	x
Terrain Features	x	Individual Fish Data	-
Access	x	Fish Preserved	-
Resorts and Campsites	x	Stomach Analysis	-
Other Developments	x	Scale Reading	-
Obstructions and Pollutions	x	Location of Inventory Sites	x
Special Restrictions	x	Photograph Directory	x
Aquatic Plants	x	Appendices:	
Wildlife Observations	x	A: Water Chemistry Analysis	x
Miscellaneous Comments	x	B: Tributary Stream Data	-
Lake Drainage	x	Bathymetric Map Reduction	x
Fisheries Management Comments	x	Bathymetric Map	x
History of Previous Surveys	x		
Water Chemistry Summary	x		

LOCATION

Location:	10 km South of Mackenzie		
Elevation:	716 m +/-		
Latitude/Longitude:	55°14'18":123°06'50"	U.T.M.:	10.4928.61212
Management Unit:	7-30	N.T.S. Map No.:	930/3

Drainage: Outlet C. --> Lions L --> Unnamed C. --> Gagnon C. --> Williston L. (Parsnip Reach) --> Peace River

PHYSICAL DATA

Lake Drainage Area:	- km^2	Volume:	233,000 m^3
Water Surface Area:	97,100 m^2	Flushing Rate:	
Area above 6 m contour:	94,300 m^2	Perimeter of Islands:	0 m
Shoreline Perimeter:	1800 m	Number of Islands:	0
Maximum Depth:	6.8 m	Mean Depth:	2.4 m
Filterable Residue (TDS):	108 mg/l	Secchi Reading:	2.95 m

Sounding Device: Lowrance X-15 Elevation Source: Contour interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 35 cm diameter spruce tree, on the east shore, at the north end of the lake, 12.0 m from the water's edge.

High water mark: 0.55 m above water level at time of survey.

Lake: **UPPER LIONS**

TERRAIN FEATURES

Immediate Shoreline:

The shoreline is generally gently sloped to the water's edge. A sedge grass border averaging 10 to 20 m in width occurs around the entire perimeter of the lake. In some areas, the sedge grass is growing on a floating organic mat up to 5 m in width. Angler and boater access from shore to the lake is somewhat difficult due to the grass fringe. Generally, the lake bottom drops off at a moderate steepness from shore. Some beaver cuttings and occasional deadfall are present but are not a major boating concern. Some patches of Potamogeton sp. are so heavy (especially north, south and west shore) that boating in these areas with an outboard is impossible.

Surrounding Country:

Upper Lions Lake is situated within the sub-boreal spruce biogeoclimatic zone. The surrounding country is characterized by flat to low rolling hills completely forested to within 10 to 20 m of the lake shore. Forest type consists of balsam fir, spruce, Lodgepole pine and the occasional birch tree. Alder is present along the fringe area. The forest appears to be mature first growth. Powerlines and poles are visible from the lake to the north and east. The forest beneath the power line has been logged off.

Lake: UPPER LIONS

ACCESS

Directions:

At present, helicopter from Mackenzie, or hike in through bush from Lions Lake. It is approximately a 5 minute ride by helicopter from the Northern Mountain Helicopter base in Mackenzie. The Provincial Forest Service in MacKenzie is proposing a trail to the lake from Lions Lake in 1990.

Road Type and Conditions:

No road access.

Restrictions:

None noted.

RESORTS AND CAMPSITES

None.

OTHER DEVELOPMENTS

Powerline clearing to the north and east of the lake.

Lake: **UPPER LIONS**

OBSTRUCTIONS AND POLLUTIONS

An old, overgrown beaver dam is present on the outlet at the lake. It appears to be an upstream barrier to fish passage.

SPECIAL RESTRICTIONS

None noted.

AQUATIC PLANTS

Aquatic plants are abundant occurring mainly in the shallows close to the lakeshore perimeter. Extensive patches of Potamogeton sp. occur along the north, south and west shores. The following species were identified in the field. None were collected.

Nuphar sp.	Myriophyllum sp.Lemnaceae sp.
Potamogeton sp.	Equisetum sp.
Potamogeton natans	eel and sedge grasses

WILDLIFE OBSERVATIONS

One beaver lodge, two ducks and one loon were sighted.

MISCELLANEOUS COMMENTS

Freshwater clams present in shallows.

Bathymetric map: The lake outline is from an enlargement of aerial photograph BC81066 No. 158 flown July 18, 1981.

Lake: **UPPER LIONS**

LAKE DRAINAGE

General:

Upper Lions Lake has no inlets and one outlet. The outlet is approximately 425 m in length draining north into Lions Lake.

Major Systems:

There are no major systems.

Minor Systems:

Unnamed C. - outlet

Lake level is controlled by a 1.0 m high x 80.0 m in length beaver dam on the outlet at the lake. Approximately four additional overgrown or remnant beaver dams occur on the outlet between Upper Lions Lake and the railway crossing 150 m downstream.

The outlet is virtually a series of low velocity beaver ponds and braided meandering sloughs, offering no salmonid spawning habitat and only marginal rearing habitat. At approximately 50 m downstream of the lake, a 60 cm diameter culvert has been installed at the base of a beaver dam to allow flow. The culvert was probably installed to help stop the power lines from being flooded.

Lake: **UPPER LIONS**

FISHERIES MANAGEMENT COMMENTS

Upper Lions Lake was surveyed in anticipation of a Lions Lake chemical (rotenone) treatment, as it is headwater to the Lions Lake system.

Enhancement options include:

1. Replace beaver dam on outlet with a permanent water control structure. (Any drop in water level could promote winter kill.)

2. Include Upper Lions Lake in a Lions Lake chemical treatment and stock with a rainbow monoculture.

3. In the event no chemical treatment occurs, stock the lake with rainbow trout. Stocking will hinge on the development of trail access. A winter oxygen/temperature profile will be conducted on the lake in February 1990 to assess potential winterkill. This is a prerequisite to any stocking.

Post Survey Note: Oxygen/temperature readings conducted on Upper Lions Lake on February 27, 1990 indicate winter oxygen levels are low. It is recommended the lake not be stocked (see following page for results).

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None.

Other Related Surveys:

Outlet to Upper Lions Lake from railway track to Lions Lake discussed in:

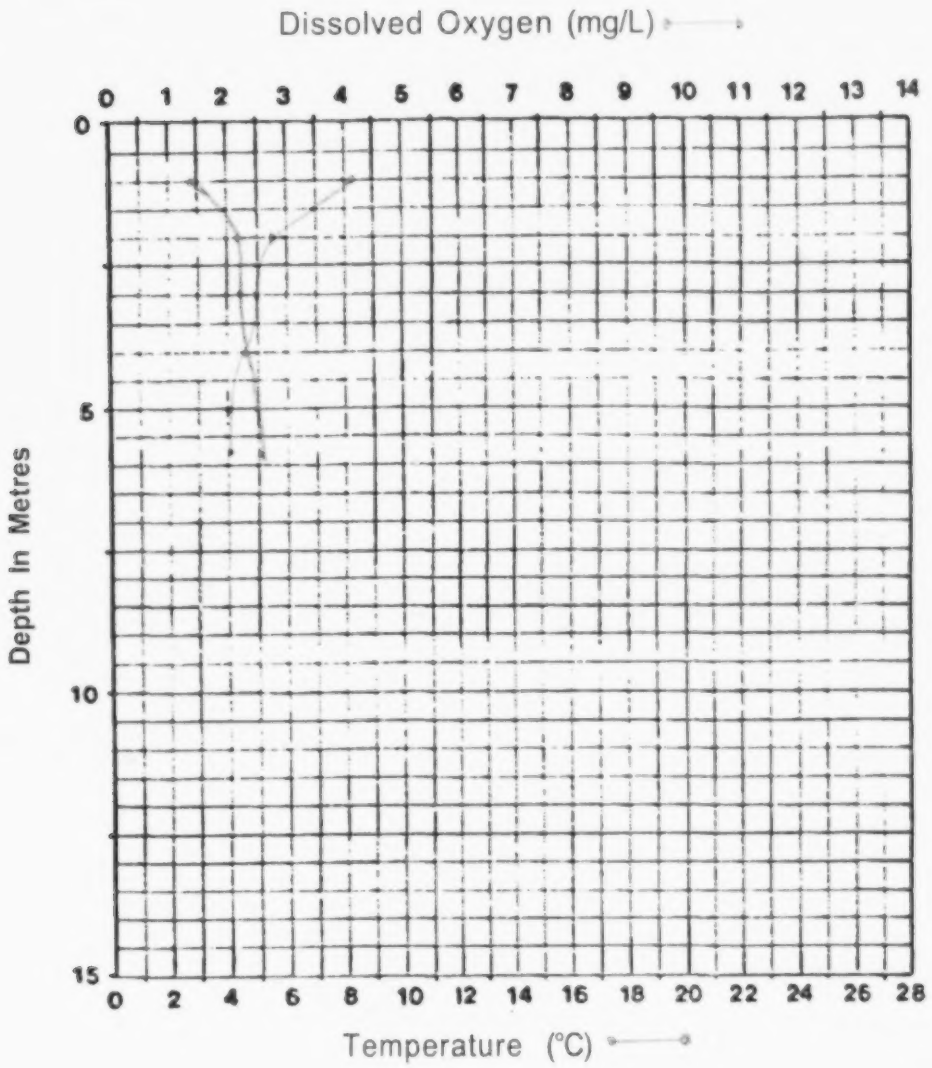
Philip, D.F., 1985. A Reconnaissance survey of Lions Lake. Ministry of Environment, Prince George, British Columbia. Unpublished.

LAKE: Upper Lions

DATE: February 27, 1990

WINTER

DISSOLVED OXYGEN AND TEMPERATURE PROFILE



Lake: **UPPER LIONS**

April 23, 1990

Re: Upper Lions Lake Winter Oxygen

On February 27, 1990, Bob Westcott and myself conducted oxygen/temperature profiles at the limnology station on Upper Lions Lake in order to determine the feasibly of stocking native rainbow trout into the lake. The following results were obtained:

Depth (m)	02 (mg/l)	Temp (°C)
Surface		
0.75	Bottom of Ice	
1.0	4.1	2.9
2.0	2.8	4.3
3.0	2.5	4.4
4.0	2.3	4.7
5.0	2.1	5.0
5.75	2.1	5.1
6.0	Bottom	

Time: 1440 hrs Air temp: 2°C Max. depth: 6.0 m
Ice cover: 75 cm Snow cover: 10 cm

Depth readings are referenced from top of ice i.e. surface = top of ice.

Method: YSI Model 58 oxygen/temp, meter

Duane A. Jesson
Williston Lake
Fisheries Technician

Lake: **UPPER LIONS**

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	September 20, 1989		
Time:	1215 hrs	Air Temperature:	11.0°C
Wind Velocity:	5 to 10 km/hr	Wind Direction:	North
Cloud Cover:	10/10 O.C.	Surface Condition:	Moderate ripple
Secchi Disc:	2.95m	Water Colour:	tannic brown

Method(s) Used:

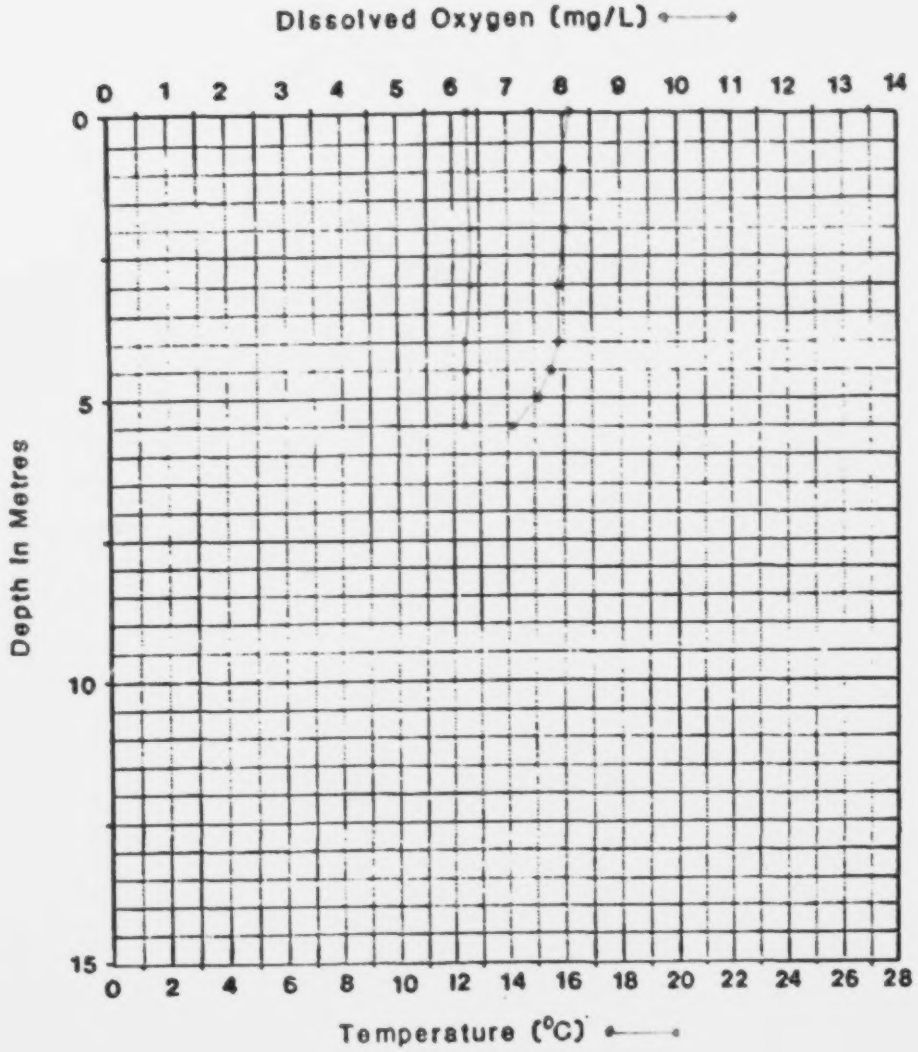
Dissolved Oxygen:	YSI model 58 oxygen/temperature meter
Water Temperature:	YSI model 58 oxygen/temperature meter
Air Temperature:	Hand-held alcohol thermometer
pH (field):	Hach color comparitor
H2S (field):	Hach H2S field test kit
Laboratory Used:	Zenon Environmental Inc. B.C. Laboratory Services
Water Sampler:	Verticle Alpha Water Bottle (Vandorn)
Substrate Sampler:	Substrate sample not taken

Water Sample Chemistry: SEAM Site No.: Not determined

	Sampling Depths	
	Surface (O m)	Lower (5.0 m)
pH (field)	7.5	7.6
pH (lab)	7.9	7.9
Specific Conductance (lab):	170 umhos/cm	170 umhos/cm
Filterable Residue 105°C (lab)	108 mg/l	110 mg/l
H2S (field)	- mg/l	0 mg/l

Bottom Depth:	5.9 m
Substrate Sample Depth:	- m

DISSOLVED OXYGEN AND TEMPERATURE PROFILE



Lake: **UPPER LIONS**

OXYGEN/TEMPERATURE DATA

Depth (m)	02 (mg/l)	Temp (C^0)
surface	8.1	12.6
1.0	8.0	12.6
2.0	8.0	12.6
3.0	7.9	12.6
4.0	7.9	12.5
4.5	7.8	12.5
5.0	7.6	12.5
5.5	7.1	12.5
5.9	Bottom	

Lake: **UPPER LIONS**

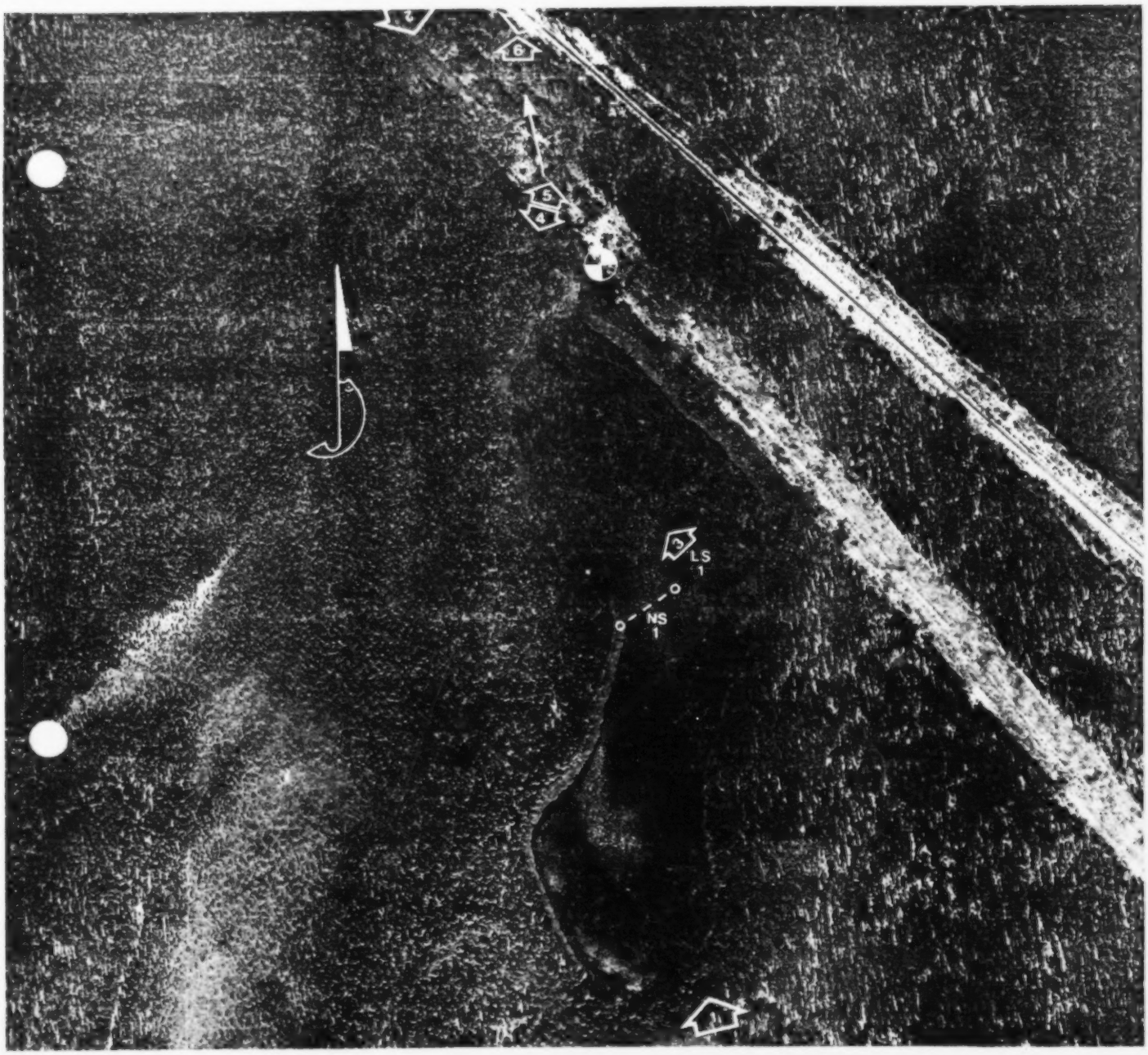
NETTING RECORD

Mesh sizes experimental order: 25,76,51,89,38,64 mm.

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	September 20, 1989	Time:	0950 hrs
Date Lifted:	September 20, 1989	Time:	1330 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	2.0 m
		Substrate:	organics
Deep End Mesh Size:	64 mm	Depth:	6.0 m
		Substrate:	organics

Comments:



LOCATION OF INVENTORY SITES

Figure 1

Lake: Upper Lions
Reference No.: B.C. 81066:158
Reference Date: July 18, 1981
Scale: 1: 5116

Plate number, area, and direction

Point sample, number, and location

Bench mark

Limno station location and number

Netting site location and number

Stream flow direction and number

Lake: **UPPER LIONS**

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
Coarse sucker	21				--	--	21	--	--	27.2 - 34.8
Longnose sucker	1				--	--	1	--	--	31.0

Comments: Some of the suckers had blackspot disease. The majority of suckers were caught in the 64 mm mesh i.e. farthest from shore.

Minnow Traps:

BAIT: Sardines

#	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1	3.3	1.25	Organics	23 redside shiner	4.0 - 9.5
2	3	0.5	Organics and some gravel	28 redside shiner	4.5 - 8.0

Comments: One leech captured in minnow trap #2. Some redside shiners had severe blackspot disease.

Lake: **UPPER LIONS**

PHOTOGRAPH DIRECTORY

Negative #	Plate #	Description
R14: 14A	1	Aerial view of Upper Lions Lake looking north.
R14: 17A	2	Aerial view of beaver pond formed by the damming of railway culvert on the outlet of Upper Lions Lake. Upper Lions Lake, as viewed looking south, is in the background. The lake is approximately 150 m upstream from the railway tracks.
R14: 9A, 10A, 12A	3	Panoramic view of shoreline looking northwest and north from the limno station. The arrow indicates the powerlines and poles visible from the lake.
R14: 2A	4	View upstream at the old, overgrown beaver dam on the outlet at the lake. The dam is approximately 1 m in height and 80 m in length.
R14: 3A	5	View looking downstream on outlet at old beaver dam and resulting pond, approximately 50 m downstream of lake.
R13: 24A	6	View of dammed railway culvert on outlet, 150 m downstream of lake.
R13: 23A	7	View looking upstream on outlet from railway tracks at beaver pond resulting from dammed culvert.

UPPER LIONS LAKE

Plate 1: Aerial view of Upper Lions Lake looking north

Plate 2: Aerial view of beaver pond formed by the damming of railway culvert on the outlet. Upper Lions Lake, as viewed looking south, is in the background. The lake is approximately 150 m upstream from the railway tracks.

Plate 3: Panoramic view of shoreline looking northwest and north from the limno station. The arrow indicates the power lines and poles visible from the lake.

Plate 4: View upstream at the old, overgrown beaver dam on the outlet at the lake. The dam is approximately 1 m in height and 80 m in length.

Plate b: view looking downstream on outlet at old beaver dam and resulting pond, approximately 50 m downstream of lake.

Plate 6: View of dammed railway culvert on outlet, 150 m downstream of lake.

Plate 7: view looking upstream on outlet from railway tracks at beaver pond resulting from dammed culvert.

Lake: UPPER LIONS

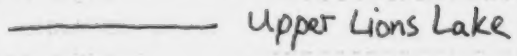
Appendix A

LABORATORY REPORT

Water Chemistry Analysis

Upper Lions Lake

Upper Lions Lake


Upper Lions Lake